

## A Theory to account for the spread of the Orange Tip Butterfly in Northern England

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In recent years there have been several reports of the Orange Tip butterfly, *Anthocharis cardamines* L., having extended its range in Northern England and Scotland (Garrad, 1972; Long, 1979). These reports agree with my own observations on the spread of this butterfly in Wharfedale, W. Yorks. over the period 1965-1979. During the early part of this period the Orange Tip appeared to be absent from much of Wharfedale: it certainly did not occur between Otley and the source of the river. Occasional sightings of the butterfly occurred between 1968-1972 and since that year it has become increasingly common between Otley and Bolton Abbey and is continuing to extend its range up the dale to beyond Grassington. In the last two years the butterfly has been a common visitor to my garden in Menston during the second half of May and females laid their eggs on the flowers of Honesty, *Lunaria biennis*.

It is always a matter of biological interest when a species suddenly extends its range, even though it may only be recovering territory which was lost at an earlier date. This seems to be the case with the Orange Tip. The habitats, which have been recolonised by *A. cardamines* in Wharfedale have not undergone marked changes in recent years, so it is tempting to seek an explanation for the extension in range of the species in terms of climate changes. As the Orange Tip has only one brood in the year, its numbers are particularly affected by the weather conditions during the single flight period. If the weather is cool and cloudy at this time, there will be fewer matings, fewer eggs deposited and the progeny for the following year will be correspondingly reduced. Perhaps the most significant deterioration in our climate within the two decades has been the marked fall in the mean temperature for the month of April, a deterioration which is well reflected in the data given in Table 1.

Month	Mean for period 1908-1977	Mean 1977	Mean 1978	Mean 1979
April	7.7°C	6.4°C	5.8°C	6.7°C
May	10.6°C	9.7°C	10.8°C	9.1°C

Table 1. Mean temperatures for the months of April and May 1977-1979, as compared with those of an earlier period, recorded at Bradford, W. Yorks.

An April mean temperature of above 7.0°C, such as was recorded at Bradford for the early decades of the present

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century would probably allow the Orange Tip to emerge towards the end of the month. The weather in April on the eastern side of the Pennines has always been very changeable and years when the month has yielded a spell of several warm and sunny days have been very few. By May, however, the weather has improved to the point where, even in unfavourable years, the month gives at least one spell of several warm sunny days and this is particularly true of the end of the month.

Assuming that the recolonising of Wharfedale by the Orange Tip has taken place by butterflies migrating up the valley from the Vale of York, where the species has always been present, it is reasonable to suppose that any tendency for this to happen prior to 1968 was prevented by the unsettled April weather. Since 1970, however, the low April mean temperatures have delayed the emergence of the Orange Tip until May, even in the most climatically favoured parts of N. England. This has probably been advantageous to the species, for it has meant that the flight period of the species has coincided with one or more periods of warm, sunny weather. Under such conditions individual butterflies would migrate from the Vale of York up the valley of the Wharfe and establish themselves, employing a life-cycle geared to a May emergence of the imagines. The same sort of thing has obviously occurred in other parts of Northern England and Scotland.

### References

- Garrad, L. S. 1972. *The Naturalist in The Isle of Man*. David and Charles.  
 Long, A. G. 1979. The Return of the Orange Tip. *Ent. Rec. J. Var.* **91** (1) 16-17. (2/3) 42-45, (6) 158-161.

## Notes and Observations

**BADONNELIA TITEI** PEARMAN (PSOCOPTERA, SPHAEROP-SOCIDAE) IN HUNTINGDONSHIRE; A SECOND BRITISH RECORD. — A single female of this very distinctive psocid was recently brought in for identification, collected on 24th February 1980 by Mrs. R. Mason on a carrycot stored in a bedroom cupboard of a ten-year-old house at Hemingford Grey, Cambs. (TL 300701) in the old county of Huntingdonshire (V.C. 31). This monotypic genus was provisionally described in 1953 by J. V. Pearman (*Entomologist's mon. Mag.*, **89**: 262) following the discovery of a single female by Mr. G. E. Tite on an atlas in Tring Museum on 10th August 1953. A further seventeen specimens of both sexes were found in the museum during the next three years and Pearman published a well-illustrated full description in 1958 (*Entomologist's mon. Mag.*, **94**: 48-52). He was of the opinion that this species normally overwinters in the egg stage but recorded "quite young nymphs in September and a female in March".